

REMARKS

This application has been reviewed in light of the Office Action dated February 16, 2005. Claims 1-3, 7 and 10 are now pending, with Claim 1 in independent form. Claims 4-6, 8, 9, and 11-18 which were previously withdrawn in view of the Restriction Requirement dated November 29, 2004, are cancelled by this amendment. Applicants reserve the right to pursue the cancelled claims in one or more divisional applications.

In view of the remarks set forth below, Applicants believe that Claims 1-3, 7, and 10 are in condition for allowance. Accordingly, favorable reconsideration of all pending claims is respectfully requested.

THE 35 U.S.C. §102(e) REJECTION OF CLAIMS 1 AND 3

In the Office Action, Claims 1 and 3 are rejected under 35 U.S.C. §102(e) as anticipated by U.S. Patent Application Publication No. US 2003/0090335 ("Lombardi et al."). It is well-established that for a reference to defeat a claim's novelty under 35 U.S.C. § 102 (*i.e.*, anticipate the claim), it must disclose each and every element of the claim. Advance Display Sys. v. Kent State Univ., 212 F.3d 1272 (Fed. Cir. 2000). Applicants respectfully request that this rejection be withdrawn because Lombardi et al. fails to teach each and every claim limitation of the claims.

The present application relates to low temperature co-fired ceramic on metal (LTCC-M) non-reciprocal devices (*i.e.*, circulators and isolators). (Specification as published in U.S. Patent Appl. Publication 2005/0040908, Abstract). The non-reciprocal

devices according to the present invention are useful in routing radio frequency (RF) signals from a transmitter to an antenna, while blocking or filtering undesirable signals reflected back towards the transmitter during a transmission. (Specification, paragraph [0002]).

An exemplary embodiment of the present invention is fabricated by co-firing a stack comprising a ferrite disk situated in a magnetic field, a conductor junction, and a plurality of insulating layers stacked on a ferrous base plate to form an integrated LTCC-M non-reciprocal device. Integrating the non-reciprocal device components into a LTCC-M package advantageously provides improved thermal conductivity, good resistivity, and high frequency impedance. It is well-known that LTCC-M is an improvement over standard LTCC technology in that the green tape layers can be supported on a metal base plate before co-firing, adding strength to the LTCC layers, permitting greater design complexity, and providing superior heat management properties. See, e.g., U.S. Patent No. 6,455,930. LTCC-M technology is also superior to standard LTCC techniques in that the metal base plate acts as a constraining layer during sintering, enabling minimal shrinkage in the x-y plane, and permitting greater precision in screen printing passive components onto the insulating layers. See, e.g., U.S. Patent No. 5,953,203.

The Lombardi et al. publication is understood to relate to a RF circulator including a low temperature co-fired ceramic (LTCC) substrate. (Lombardi et al., Abstract). However, Lombardi et al. is limited to a LTCC substrate, and does not teach or suggest the use of a LTCC-M package. In the Office Action, the Examiner suggests that the upper and

lower steel plate layers on the outer surfaces of the LTCC package are equivalent to the metal base support layer used in the LTCC-M package described in the present invention. In Lombardi et al., upper and lower steel plates 44a, 44b are used as magnetic field spreaders to spread and shape magnetic flux density. (Lombardi et al., paragraph [0035]). Nothing in Lombardi et al. describes or suggests that the steel magnetic field spreading plates are used in the manufacturing process as support structures for the green tape layers during the co-firing process. Hence, Lombardi does not disclose the use of LTCC-M technology. In fact, Lombardi et al. teaches away from the use of a LTCC-M substrate, as provided in the following excerpt: “[W]hile steel plates 44a, 44b are shown, it will be recognized that any magnetically responsive material can be used in place of steel.” (Lombardi et al., paragraph [0036]) (emphasis added). One having ordinary skill in the art will appreciate that not all magnetically responsive materials are suitable for use as metal support layers during LTCC-M package fabrication.

The claims of the present application are specifically directed to the use of LTCC-M technology. Accordingly, because Lombardi et al. does not teach, suggest, or disclose the use of a LTCC-M integrated non-reciprocal device, the §102(e) rejection of pending Claims 1 and 3 should be withdrawn.

THE 35 U.S.C. §103(A) REJECTIONS OF CLAIMS 2, 7, AND 10

Claims 2, 7, and 10 stand rejected under 35 U.S.C. § 103(a) as obvious in view of Lombardi et al in combination with the Applicants' admitted prior art Figs 1-2, U.S. Patent No. 3,935,549 (“Jachowski”), and U.S. Patent No. 5,644,327 (“Onyskevych et al.”),

respectively. However, the cited reference combinations fail to teach or suggest a non-reciprocal device integrated into a LTCC-M package, as set forth in independent Claim 1. Accordingly, for at least the reasons set forth above, Applicants respectfully request the withdrawal of the 35 U.S.C. § 103(a) rejection of Claims 2, 7, and 10.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and an early allowance of the claims pending in the present application.

Applicants' undersigned attorney may be reached by telephone at (973) 597-2500. All correspondence should continue to be directed to our address listed below.

Respectfully submitted,



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